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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/510,696 | ZHANG ET AL. | |
| | Examiner | Art Unit | |
| | GERALD SMARTH | 2446 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *10/08/04*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-43* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-43* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 October 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *10/08/04, 05/09/05*.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

## DETAILED ACTION

1. It is hereby acknowledged that the following papers in application No. 10/510696 have been received and placed of record in the file: Remark date 01/08/04.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-3, 6-15, 18-20, 24-33, 35-42 rejected under 35 U.S.C. 102(e) as being anticipated by Cao (6876639),

Regarding claim 1, Cao teaches method for managing a communication between a first network element and a second network element, wherein the communication is performed via a network on a packet basis, acknowledgment messages acknowledging receipt of packets are returned to the network element having sent these packets, ***(Cao***

***discloses if every packet is acknowledged within the timeout period and TCP does not timeout, the congestion window of the server 20 is increased exponentially with each acknowledgement received; Column 2 lines 36-40)*** and a congestion control is performed ***(Cao discloses When a handoff notification is received, the TCP protocol stack operates to freeze the server's congestion window and force the server to suspend its transmissions to the mobile host; Column 4 lines 39-44)*** which variably defines an allowable number of packets which can be sent before receipt of acknowledgment messages for these packets, wherein said allowable number of packets is reduced in case of packet loss during transmission, ***(Cao discloses In order to avoid TCP timeouts and reduce any adverse effect on transmission performance, it would be desirable that TCP hosts such as the mobile host 18 and the server 20 respond more robustly to periods of transmission loss occurring during mobile handoff; Column 3 lines 65-69)*** wherein, when the first network element performs a hand-over and sends a message informing the network or a network element on the hand-over, the network or network element changes the congestion control to provide faster recovery rate of said allowable number after handover as compared to the recovery rate of said allowable number after packet loss. ***(Cao discloses advantageously, by notifying the server before and after each handoff, the TCPHN mechanism will prevent the TCP protocol stack from timing out during handoff and allow fast recovery of the TCP connection with the mobile host; Column 4 lines 57-61)***

Regarding claim 2, Cao taught a method according to claim 1, as described above. Cao further teaches wherein the congestion control provides a congestion window of variable size, the size of the congestion window defining said allowable number of packets which can be sent before receipt of acknowledgment messages for these packets, and the size being controlled dependant on the number of sent packets for which no acknowledgment messages have been received so that the window size is reduced in case of packet loss during transmission, ***(Cao discloses when the congestion window reaches a pre-defined slow-start threshold, TCP transitions into a "congestion avoidance" state during which the exponential congestion window growth is reduced to a slow linear growth and stabilized at a particular level which represents the most efficient transmission rate at which TCP can transmit packets without timing out; Column 40-46*)** wherein, when the first network element; performs a hand-over and sends a message informing the network or a network element on the hand-over, the network or network element changes the congestion window size control to provide faster recovery rate of the window size after handover as compared to the recovery rate of the window size after packet loss. ***(Cao discloses advantageously, by notifying the server before and after each handoff, the TCPHN mechanism will prevent the TCP protocol stack from timing out during handoff and allow fast recovery of the TCP connection with the mobile host; Column 4 lines 57-61)***

Regarding claim 3, Cao taught the method according to claim 1, as described above. Cao further teaches wherein said congestion control is performed in at least one of the first and second network elements. ***(Cao discloses When a handoff notification is received, the TCP protocol stack operates to freeze the server's congestion window and force the server to suspend its transmissions to the mobile host; Column 4 lines 39-44)***

Regarding claim 6, Cao taught the method according to claim 1, as described above. Cao further teaches wherein said second network element comprises a fast retransmit and fast recovery algorithm so as to provide said faster recovery rate, wherein, when the message is sent from the first network element to the second network element, the second network element, when receiving the message, triggers the invocation of said fast retransmit and fast recovery algorithm. ***(Cao discloses another adverse effect of TCP timeouts is that unacknowledged packets are retransmitted. If, for example, packets are transmitted by the server 20 and not received or acknowledged by the mobile host 18 because of a handoff, the packets will be retransmitted; Column 2 lines 60-64)***

Regarding claim 7, Cao taught the method according to claim 1, as described above. Cao further teaches wherein said first network element comprises a fast retransmit and fast recovery algorithm so as to provide said faster recovery rate, and is adapted to

trigger, when generating said message, the invocation of said fast retransmit and fast recovery algorithm. ***(Cao discloses another adverse effect of TCP timeouts is that unacknowledged packets are retransmitted. If, for example, packets are transmitted by the server 20 and not received or acknowledged by the mobile host 18 because of a handoff, the packets will be retransmitted; Column 2 lines 60-64)***

Regarding claim 8, Cao taught the method according to claim 1, as described above. Cao further teaches wherein the faster recovery rate includes a step of increasing the size of a congestion window in a step-wise manner. ***(Cao discloses another adverse effect of TCP timeouts is that unacknowledged packets are retransmitted. If, for example, packets are transmitted by the server 20 and not received or acknowledged by the mobile host 18 because of a handoff, the packets will be retransmitted; Column 2 lines 60-64)***

Regarding claim 9, Method according to claim 8, as described above. Cao further teaches wherein the size of the congestion window is step-wise increased to 20% to 100% of the size of the congestion value before start of the handover. ***(Cao discloses when the congestion window reaches a pre-defined slow-start threshold, TCP transitions into a "congestion avoidance" state during which the exponential congestion window growth is reduced to a slow linear growth and stabilized at a particular level which represents the most efficient transmission rate at which***

***TCP can transmit packets without timing out; Column 40-46***)

Regarding claim 10, Cao taught the method according to claim 9, as described above. Cao further teaches wherein the size of the congestion window is step-wise increased to at least approximately 50% of the size of the congestion value before start of the handover. ***(Cao discloses when the congestion window reaches a pre-defined slow-start threshold, TCP transitions into a "congestion avoidance" state during which the exponential congestion window growth is reduced to a slow linear growth and stabilized at a particular level which represents the most efficient transmission rate at which TCP can transmit packets without timing out; Column 40-46***)

Regarding claim 11, Cao taught the method according to claim 1, as described above. Cao further teaches wherein the faster recovery rate is implemented by increasing the size of a congestion window in a step-wise manner to a value lying in a range from more than a minimum window size up to, and including the size of the window before handover, and by subsequent ramp-like or exponential increase of the congestion window size. ***(Cao discloses when the congestion window reaches a pre-defined slow-start threshold, TCP transitions into a "congestion avoidance" state during which the exponential congestion window growth is reduced to a slow linear growth and stabilized at a particular level which represents the most efficient transmission rate at which TCP can transmit packets without timing out; Column***

***40-46*)**

Regarding claim 12, Cao taught a method according to claim 1, as described above. Cao further teaches wherein the congestion control includes increasing the size of a congestion window in an exponential manner up to a threshold value and a subsequent ramp-like increasing of the congestion window size, wherein the faster recovery rate is implemented by setting the threshold value to at least one-half of, and up to, the previous value of the congestion window before start of the handover. ***(Cao discloses when the congestion window reaches a pre-defined slow-start threshold, TCP transitions into a "congestion avoidance" state during which the exponential congestion window growth is reduced to a slow linear growth and stabilized at a particular level which represents the most efficient transmission rate at which TCP can transmit packets without timing out; Column 40-46*)**

Regarding claim 13, Cao taught a method according to claim 1, as described above. Cao further teaches wherein the second network element is a correspondent node. ***(Cao discloses when a handoff notification is received, the TCP protocol stack operates to freeze the server's congestion window and force the server to suspend its transmissions to the mobile host; Column 4 lines 39-44)***

Regarding claim 14, Cao taught a method according to claim 1, as described above.

Cao further teaches wherein at least one of the first and second network elements comprises a congestion control means, and wherein when generating or receiving said message, the first and/or second network element informs its congestion control means which in response triggers the invocation of a fast retransmit and fast recovery algorithm. ***(Cao discloses another adverse effect of TCP timeouts is that unacknowledged packets are retransmitted. If, for example, packets are transmitted by the server 20 and not received or acknowledged by the mobile host 18 because of a handoff, the packets will be retransmitted; Column 2 lines 60-64)***

Regarding claim 15, Cao taught a method according to claim 1, as described above. Cao further teaches a wherein at least one of the first and second network elements comprises a congestion control means, wherein the network element when generating or receiving said message, sends a signal to the congestion control means, the signal indicating to the congestion control means that the congestion control is to be changed so as to provide said faster recovery rate. ***(Cao discloses advantageously, by notifying the server before and after each handoff, the TCPHN mechanism will prevent the TCP protocol stack from timing out during handoff and allow fast recovery of the TCP connection with the mobile host; Column 4 lines 57-61)***

Regarding claim 18, Cao teaches a system for managing a communication between a first network element and a second network element, wherein the communication is performed via a network on a packet basis, and acknowledgment messages acknowledging receipt of packets are returned to the network element having sent these packets, ***(Cao discloses if every packet is acknowledged within the timeout period and TCP does not timeout, the congestion window of the server 20 is increased exponentially with each acknowledgement received; Column 2 lines 36-40)*** comprising congestion control means for performing a congestion control ***(Cao discloses When a handoff notification is received, the TCP protocol stack operates to freeze the server's congestion window and force the server to suspend its transmissions to the mobile host; Column 4 lines 39-44)*** which variably defines an allowable number of packets which can be sent before receipt of acknowledgment messages for these packets, wherein said allowable number of packets is reduced in case of packet loss during transmission, ***(Cao discloses In order to avoid TCP timeouts and reduce any adverse effect on transmission performance, it would be desirable that TCP hosts such as the mobile host 18 and the server 20 respond more robustly to periods of transmission loss occurring during mobile handoff; Column 3 lines 65-69)*** wherein, when the first network element performs a hand-over and sends a message informing the network or a network element on the hand-over, the congestion control means changes the congestion control to provide faster recovery rate of said allowable number after handover as compared to the recovery rate of said allowable number after packet loss.

***(Cao discloses advantageously, by notifying the server before and after each handoff, the TCPHN mechanism will prevent the TCP protocol stack from timing out during handoff and allow fast recovery of the TCP connection with the mobile host; Column 4 lines 57-61)***

Regarding claim 19, Cao taught system according to claim 18, as described above. Cao further teaches wherein the congestion control means provides a congestion window of variable size, the size of the congestion window defining said allowable number of packets which can be sent before receipt of acknowledgment messages for these packets, and the size being controlled dependant on the number of sent packets for which no acknowledgment messages have been received so that the window size is reduced in case of packet loss during transmission, ***(Cao discloses when the congestion window reaches a pre-defined slow-start threshold, TCP transitions into a "congestion avoidance" state during which the exponential congestion window growth is reduced to a slow linear growth and stabilized at a particular level which represents the most efficient transmission rate at which TCP can transmit packets without timing out; Column 40-46)*** wherein, when the first network element performs a hand-over and sends a message informing the network or a network element on the hand-over, the congestion control means is adapted to change the congestion window size control to provide faster recovery rate of the window size after handover as compared to the recovery rate of the window size after packet loss. ***(Cao discloses advantageously, by notifying the server before and after each***

***handoff, the TCPHN mechanism will prevent the TCP protocol stack from timing out during handoff and allow fast recovery of the TCP connection with the mobile host; Column 4 lines 57-61)***

Regarding claim 20, Cao teaches a system according to claim 18 or 19, as describe above. Cao further teaches wherein said congestion control means is provided in at least one of the first and second network elements. ***(Cao discloses When a handoff notification is received, the TCP protocol stack operates to freeze the server's congestion window and force the server to suspend its transmissions to the mobile host; Column 4 lines 39-44)***

Regarding claim 23, Cao taught a system according to claim 18, as described above. Cao further teaches wherein said second network element comprises a fast retransmit and fast recovery algorithm so as to provide said faster recovery rate, wherein, when the message is sent from the first network element to the second network element, the second network element, when receiving the message, triggers the invocation of said fast retransmit and fast recovery algorithm. ***(Cao discloses advantageously, by notifying the server before and after each handoff, the TCPHN mechanism will prevent the TCP protocol stack from timing out during handoff and allow fast recovery of the TCP connection with the mobile host; Column 4 lines 57-61)***

Regarding claim 24, Cao taught a system according to claim 18, as described above.

wherein said first network element comprises a fast retransmit and fast recovery algorithm so as to provide said faster recovery rate, and is adapted to trigger, when generating said message, the invocation of said fast retransmit and fast recovery algorithm. ***(Cao discloses advantageously, by notifying the server before and after each handoff, the TCPHN mechanism will prevent the TCP protocol stack from timing out during handoff and allow fast recovery of the TCP connection with the mobile host; Column 4 lines 57-61)***

Regarding claim 25, Cao taught a system according to claim 18, as described above. Cao further teaches wherein the faster recovery rate includes a step of increasing the size of a congestion window in a step-wise manner. ***(Cao discloses another adverse effect of TCP timeouts is that unacknowledged packets are retransmitted. If, for example, packets are transmitted by the server 20 and not received or acknowledged by the mobile host 18 because of a handoff, the packets will be retransmitted; Column 2 lines 60-64)***

Regarding claim 26, Cao taught a system according to claim 25, as described above. Cao further teaches wherein the size of the congestion window is step-wise increased to 20% to 100% of the size of the congestion value before start of the handover. ***(Cao discloses when the congestion window reaches a pre-defined slow-start threshold, TCP transitions into a "congestion avoidance" state during which the exponential congestion window growth is reduced to a slow linear growth and***

***stabilized at a particular level which represents the most efficient transmission rate at which TCP can transmit packets without timing out; Column 40-46*)**

Regarding claim 27, Cao further teaches a system according to claim 26, as described above. Cao further teaches wherein the size of the congestion window is step-wise increased to at least approximately 50% of the size of the congestion value before start of the handover. ***(Cao discloses when the congestion window reaches a pre-defined slow-start threshold, TCP transitions into a "congestion avoidance" state during which the exponential congestion window growth is reduced to a slow linear growth and stabilized at a particular level which represents the most efficient transmission rate at which TCP can transmit packets without timing out; Column 40-46*)**

Regarding claim 28, Cao further teaches system according to claim 18, as described above. Cao further teaches wherein the faster recovery rate is implemented by increasing the size of a congestion window in a step-wise manner to a value lying in a range from more than a minimum window size up to, and including the size of the window before handover, and by subsequent ramp-like or exponential increase of the congestion window size. ***(Cao discloses when the congestion window reaches a pre-defined slow-start threshold, TCP transitions into a "congestion avoidance" state during which the exponential congestion window growth is reduced to a slow linear growth and stabilized at a particular level which represents the most***

***efficient transmission rate at which TCP can transmit packets without timing out; Column 40-46*)**

Regarding claim 29, Cao further teaches system according to claim 18, as described above. Cao further teaches wherein the congestion control includes increasing the size of a congestion window in an exponential manner up to a threshold value and a subsequent ramp-like increasing of the congestion window size, wherein the faster recovery rate is implemented by setting the threshold value to at least one-half of, and up to, the previous value of the congestion window before start of the handover. ***(Cao discloses when the congestion window reaches a pre-defined slow-start threshold, TCP transitions into a "congestion avoidance" state during which the exponential congestion window growth is reduced to a slow linear growth and stabilized at a particular level which represents the most efficient transmission rate at which TCP can transmit packets without timing out; Column 40-46*)**

Regarding claim 30, Cao further teaches a system according to claim 18, as described above. Cao further teaches wherein the second network element is a correspondent node. ***(Cao discloses when a handoff notification is received, the TCP protocol stack operates to freeze the server's congestion window and force the server to suspend its transmissions to the mobile host; Column 4 lines 39-44)***

Regarding claim 31, Cao further teaches system according to claim 18, as described

above. Cao further teaches wherein at least one of the first and second network elements comprises a congestion control means, and wherein when generating or receiving said message, the first and/or second network element informs its congestion control means which in response triggers the invocation of a fast retransmit and fast recovery algorithm. ***(Cao discloses advantageously, by notifying the server before and after each handoff, the TCPHN mechanism will prevent the TCP protocol stack from timing out during handoff and allow fast recovery of the TCP connection with the mobile host; Column 4 lines 57-61)***

Regarding claim 32, Cao further teaches a system according to claim 18, as describe above. Cao further teaches wherein at least one of the first and second network elements comprises a congestion control means, wherein the network element when generating or receiving said message, sends a signal to the congestion control means, the signal indicating to the congestion control means that the congestion control is to be changed so as to provide said faster recovery rate. ***(Cao discloses advantageously, by notifying the server before and after each handoff, the TCPHN mechanism will prevent the TCP protocol stack from timing out during handoff and allow fast recovery of the TCP connection with the mobile host; Column 4 lines 57-61)***

Regarding claim 35, Cao taught a network element to be used in a system for managing a communication between network elements, preferably as defined in claim 18, as

described above. Cao further teaches wherein the communication is performed via a network on a packet basis, and acknowledgment messages acknowledging receipt of packets are returned to the network element having sent these packets, comprising congestion control means for performing a congestion control which variably defines an allowable number of packets which can be sent before receipt of acknowledgment messages for these packets, wherein said allowable number of packets is reduced in case of packet loss during transmission, wherein, when the network element performs a hand-over and sends a message informing the network or a network element on the hand-over, the congestion control means changes the congestion control to provide faster recovery rate of said allowable number after handover as compared to the recovery rate of said allowable number after packet loss. ***(Cao discloses advantageously, by notifying the server before and after each handoff, the TCPHN mechanism will prevent the TCP protocol stack from timing out during handoff and allow fast recovery of the TCP connection with the mobile host; Column 4 lines 57-61)***

Regarding claim 36, Cao taught a network element according to claim 35, as described above. Cao further teaches wherein the congestion control means provides a congestion window of variable size, the size of the congestion window defining said allowable number of packets which can be sent before receipt of acknowledgment messages for these packets, and the size being controlled dependant on the number of sent packets for which no acknowledgment messages have been received so that the

window size is reduced in case of packet loss during transmission, ***(Cao discloses when the congestion window reaches a pre-defined slow-start threshold, TCP transitions into a "congestion avoidance" state during which the exponential congestion window growth is reduced to a slow linear growth and stabilized at a particular level which represents the most efficient transmission rate at which TCP can transmit packets without timing out; Column 40-46)*** wherein, when the network element performs a hand-over and sends a message informing the network or a network element on the hand-over, the congestion control means changes the congestion window size control to provide faster recovery rate of the window size after handover as compared to the recovery rate of the window size after packet loss. ***(Cao discloses advantageously, by notifying the server before and after each handoff, the TCPHN mechanism will prevent the TCP protocol stack from timing out during handoff and allow fast recovery of the TCP connection with the mobile host; Column 4 lines 57-61)***

37. Network element according to claim 35 or 36, wherein said network element comprises a fast retransmit and fast recovery algorithm so as to provide said faster recovery rate, and is adapted to trigger, when generating said message, the invocation of said fast retransmit and fast recovery algorithm. ***(Cao discloses another adverse effect of TCP timeouts is that unacknowledged packets are retransmitted. If, for example, packets are transmitted by the server 20 and not received or acknowledged by the mobile host 18 because of a handoff, the packets will be***

***retransmitted; Column 2 lines 60-64)***

Regarding claim 38, Cao taught a network element according to claim 35, as described above. Cao further teaches wherein the faster recovery rate includes a step of increasing the size of a congestion window in a step-wise manner, wherein the size of the congestion window is step-wise increased to 20% to 100% of the size of the congestion value before start of the handover. ***(Cao discloses when the congestion window reaches a pre-defined slow-start threshold, TCP transitions into a "congestion avoidance" state during which the exponential congestion window growth is reduced to a slow linear growth and stabilized at a particular level which represents the most efficient transmission rate at which TCP can transmit packets without timing out; Column 40-46)***

Regarding claim 39, Cao taught a Network element according to claim 37, as described above. Cao further teaches wherein the size of the congestion window is step-wise increased to at least approximately 50% of the size of the congestion value before start of the handover. ***(Cao discloses when the congestion window reaches a pre-defined slow-start threshold, TCP transitions into a "congestion avoidance" state during which the exponential congestion window growth is reduced to a slow linear growth and stabilized at a particular level which represents the most efficient transmission rate at which TCP can transmit packets without timing out; Column 40-46)***

Regarding claim 40, Cao taught a network element according to claim 35, as described above. Cao further teaches wherein the congestion control includes increasing the size of a congestion window in an exponential manner up to a threshold value and a subsequent ramp-like increasing of the congestion window size, wherein the faster recovery rate is implemented by setting the threshold value to at least one-half of, and up to, the previous value of the congestion window before start of the handover. ***(Cao discloses when the congestion window reaches a pre-defined slow-start threshold, TCP transitions into a "congestion avoidance" state during which the exponential congestion window growth is reduced to a slow linear growth and stabilized at a particular level which represents the most efficient transmission rate at which TCP can transmit packets without timing out; Column 40-46)***

Regarding claim 41, Cao taught a network element according to claim 35, as describe above. Cao further teaches wherein the network element comprises a congestion control means, and wherein when generating or receiving said message, the network element informs its congestion control means which in response triggers the invocation of a fast retransmit and fast recovery algorithm. ***(Cao discloses another adverse effect of TCP timeouts is that unacknowledged packets are retransmitted. If, for example, packets are transmitted by the server 20 and not received or acknowledged by the mobile host 18 because of a handoff, the packets will be***

***retransmitted; Column 2 lines 60-64)***

Regarding claim 4, Cao taught a network element according to claim 35, as described above. Cao further teaches wherein the network element comprises a congestion control means, wherein the network element when generating or receiving said message, sends a signal to the congestion control means, the signal indicating to the congestion control means that the congestion control is to be changed so as to provide said faster recovery rate. ***(Cao discloses advantageously, by notifying the server before and after each handoff, the TCPHN mechanism will prevent the TCP protocol stack from timing out during handoff and allow fast recovery of the TCP connection with the mobile host; Column 4 lines 57-61)***

### *Claim Rejections - 35 USC § 103*

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 4, 5, 16, 17, 21, 22, 33, 34, 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cao (6876639) in view of Gwon (2003/0016655),

Regarding claim 4, Cao taught the method according to claim 1, as described above. Gwon further teaches wherein the first network element is a mobile node which, when moving from one subnet into another foreign subnet, acquires a care-of address, and sends said message to its home network and/or to a correspondent node informing the network or node on the care-of-address. ***(Gwon discloses the mobile node's new "care of" address includes the new local router's IP address and a sub-net address component for the mobile node 135 as advertised by the local router R2; Paragraph 50 lines 6-9 )***

Cao does not explicitly disclose these limitations however Gwon does teach first network element is a mobile node which, when moving from one subnet into another foreign subnet, acquires a care-of address, and sends said message to its home network and/or to a correspondent node informing the network or node on the care-of-address.

It would be obvious to a person of ordinary skill in the art at the time of the invention to modify Transmission control protocol handoff notification of Cao to include Gwon's fast dynamic route establishment in wireless, mobile access digital network using mobility prediction. One of ordinary skill in the art would have been motivated to make this modification in order to have a more efficient method of reducing packet latency. *Gwon discloses More specifically what is needed is a way to reduce packet latency and jitter in third generation, wireless, mobile access IP data networks that is operative within the proposed Mobile IP standards and that reduces packet latency and jitter resulting in*

*real-time from data communication hand-off processes, including dynamic packet rerouting; Paragraph 23.*

Therefore, it would be obvious to combine Cao and Gwon to arrive at the limitations in claim 4.

Regarding claim 5, Cao taught a method according to claim 1, as described above. Gwon further teaches wherein said message is a "Binding Update" message. ***(Gwon discloses the mobile node 135 registers the new "care of" IP address with its home area router (HA) and optionally with one or more correspondent nodes 140 by sending binding update messages containing both the new "care of" IP address and the mobile node's permanent home IP address; Paragraph 50 lines 9-14)***

Regarding claim 16, Cao taught a method according to claim 15, as described above. Gwon further teaches wherein the signal is implemented by duplicating ACK packets by an IP layer function to a TCP layer function. ***(Gwon discloses where connectionless IP routing is in use, once the Binding Update Acknowledgement is received, the mobile node 135 switches or hands-off its communication link with the network 100 from the current foreign agent to the next foreign agent; Paragraph 83 lines 1-5)***

Regarding claim 17, Cao taught a Method according to claim 1, as described above. Gwon further teaches wherein the communication between the first and second network elements is an Mobile IPv6-based communication. ***(Gwon discloses in either instance, the switch or hand-off is accomplished simply by the mobile node 135 de-registering with the previous foreign agent and beginning to use the new foreign agent for communications as described in the Mobile IP version 4 and 6 documents identified and incorporated by reference; Paragraph 83 lines –10)***

Regarding claim 21, Cao taught a system according to claim 18, as described above. Gwon further teaches wherein the first network element is a mobile node which, when moving from one subnet into another foreign subnet, acquires a care-of address, and sends said message to its home network informing the latter on the care-of-address. ***(Gwon discloses the mobile node's new "care of" address includes the new local router's IP address and a sub-net address component for the mobile node 135 as advertised by the local router R2; Paragraph 50 lines 6-9 )***

Regarding claim 22, Cao taught a system according to claim 18, as described above. Gwon further teaches wherein said message is a "Binding Update" message. ***(Gwon discloses the mobile node 135 registers the new "care of" IP address with its home area router (HA) and optionally with one or more correspondent nodes 140 by sending binding update messages containing both the new "care of" IP address and the mobile node's permanent home IP address; Paragraph 50 lines***

***9-14)***

Regarding claim 33, Cao taught System according to claim 32, as described above. Gwon further teaches wherein the signal is implemented by duplicating ACK packets by an IP layer function to a TCP layer function. ***(Gwon discloses where connectionless IP routing is in use, once the Binding Update Acknowledgement is received, the mobile node 135 switches or hands-off its communication link with the network 100 from the current foreign agent to the next foreign agent; Paragraph 83 lines 1-5)***

Regarding claim 34, Cao taught a system according to any one of the preceding system claim 18, as described above. Gwon further teaches wherein the communication between the first and second network elements is an Mobile IPv6-based communication. ***(Gwon discloses in either instance, the switch or hand-off is accomplished simply by the mobile node 135 de-registering with the previous foreign agent and beginning to use the new foreign agent for communications as described in the Mobile IP version 4 and 6 documents identified and incorporated by reference; Paragraph 83 lines –10)***

Regarding claim 43, Cao further taught a network element according to claim 42, as described above. Gwon further teaches wherein the signal is implemented by

duplicating ACK packets by an IP layer function to a TCP layer function. ***(Gwon discloses where connectionless IP routing is in use, once the Binding Update Acknowledgement is received, the mobile node 135 switches or hands-off its communication link with the network 100 from the current foreign agent to the next foreign agent; Paragraph 83 lines 1-5)***

## ***Conclusion***

6. The following prior art made of record and not relied upon is cited to establish the level of skill in the applicant's art and those arts considered reasonably pertinent to applicant's disclosure. See MPEP 707.05 ©.

7. The following reference teaches execution of trial data.

US 2003/0035407

US 6934752

US 6704571

US 5912878

US 6208620

The examiner requests, in response to this Office action, support be shown for language added to any original claims on amendment and any new claim. That is indicated support for newly added claim language by specifically pointing to page(s) and line no(s) in the specification and/or drawing figure(s). This will assist the examiner in prosecuting the application.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gerald Smarth whose telephone number is (571)270-1923. The examiner can normally be reached on Monday-Friday(7:30am-5:00pm)est.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeff Pwu can be reached on (571)272-6798. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/GERALD SMARTH/

Examiner, Art Unit 2446

/Jeffrey Pwu/

Supervisory Patent Examiner, Art Unit 2446